

**Division of Water
Human Health Criteria (HHC) Technical Workgroup
Meeting #5 Notes
January 26, 2016**

Time of Meeting: 9 AM – 11 AM

Location of Meeting: via GoToMeeting

Technical Workgroup for Water Quality Standards HHC Members present:

- Larry Duffy, University Alaska Fairbanks
- Marylynne Kostick, Alaska Department of Fish & Game/Division of Subsistence (DF&G/Subsistence)
- Bob Gerlach, DEC Division of Environmental Health (DEC/EH)
- Ali Hamade, Alaska Department of Health & Social Services/Division of Public Health (DHSS/DPH)
- Brett Jokela, Anchorage Water and Wastewater Utility
- Alison Kelley, NANA Regional Corporation (NANA)
- Michael Opheim, Seldovia Village Tribe (Seldovia); Tracie Merrill, Seldovia
- Nancy Sonafrank, DEC Division of Water (DEC/DOW)
- Lori Verbrugge, US Fish and Wildlife Service (USFWS)
- Kendra Zamzow, Center for Science in Public Participation (CSP2)

Technical Advisor:

- Lon Kissinger, USEPA R10

Interested Parties present:

- Lincoln Loehr
- Robert Napier, Teck Alaska
- Gerald Anelon
- Cheryl Niemi, WA Department of Ecology
- Ron Rimmelman, NovaGold
- Matt Szelag, USEPA R10
- Kris Holm
- Jessica Fisher, HilCorp
- Guy Archibald
- Jennifer Hanlon, Tlingit & Haida Central Council

Meeting Facilitator: Brock Tabor, ADEC/DOW

Meeting Notetaker: Gina Shirey, ADEC/DOW

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Action Items:

Who	Will do What	By (Date)
Lon Kissinger, EPA	Provide a list of nonlinear carcinogens, e.g. aldehyde	Next meeting (February 24)

Agenda for Water Quality Standards HHC Technical Workgroup (HHC Workgroup)

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- **Recap of the of Draft Workgroup Report outline**
 - Questions/Comments about the text to date?
- **Introduce Issue 4b: What is the role of Relative Source Contribution (RSC) in relation to other exposure issues and what are Alaska's options?**
- **Presentations at Alaska Forum on the Environment- Tues/Wed afternoon**
- **Public Comment**

Meeting Documents

1. Technical Workgroup Notebook
 - a. Chapter 4: Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000): (NOTE THAT THIS DOCUMENT WILL NOT BE IN THE NOTEBOOK DUE TO SIZE OF DOCUMENT)
http://water.epa.gov/scitech/swguidance/standards/upload/2005_05_06_criteria_humanhealth_method_complete.pdf
 - b. EPA RSC Presentation
 - c. Washington RSC brief
 - d. Idaho RSC Whitepaper

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Recap of the of Draft Workgroup Report outline

DEC received a couple of comments from members of the workgroup and incorporated information into the report accordingly. Brock's working on new draft. He is addressing comments and adding more details. Brock asked if there were any specific questions about draft report. No questions or comments were provided at this time.

Michelle acknowledged that the report was bare bones. DEC needs to get input on all of the technical issues before adding much of the substance needed to make this a useful product

Brock asked about the HHC Excel tool presented at Meeting #4 and if anyone had a chance to try it out?

- Q: Is there a way to better identify the different carcinogens so that you can recognize if the pollutant is a linear or non-linear carcinogen? Maybe for 94 contaminants in the tool, you can breakdown what category the carcinogens fall into?
- EPA: There aren't that many nonlinear carcinogens. It might be better to understand the process for identifying them as linear or non-linear.
 - **Action Item:** EPA will pull together a list of the nonlinear carcinogens.
- There may need to be different regions to account for marine mammal consumption – region(s) where there is significant consumption of marine mammals and region(s) without significant consumption of marine mammals.
- Trophic levels for marine mammals is not always Tier 5.
- Effective trophic level of marine mammals may be higher due to differential accumulation of contaminants in the fat layers (e.g. seal oil) which is consumed.

If you have any more questions about the Excel tool, feel free to contact Brock or Nancy. They are open to a small group presentation on spreadsheet if anyone is interested.

Introduce Issue 4b: What is the role of Relative Source Contribution (RSC) in relation to other exposure issues and what are Alaska's options?

Brock showed the slide with the HHC Equation(s). He said that today we'll be talking about Relative Source Contribution (RSC). The RSC is in the numerator of the equation. RSC addresses risk management for noncarcinogens and non-linear carcinogens.

When Brock was researching the topic, he identified three sources of information: an EPA RSC presentation and two white papers by Washington State and Idaho. The documents were given to the workgroup members and the public attendees. The purpose of providing this information was to give different perspectives on the topic.

RSC is used in the HHC formula for non-carcinogens and carcinogens with a non-linear response to dose. It affects the reference dose, which is also in the numerator. The RSC is the ratio of a specific

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contaminate as found in water intake and/or fish/shellfish intake from a waterbody to total daily exposure from all sources. RSC is intended to capture contaminants that may be part of the intake from drinking non-treated surface waters, drinking treated water that may not capture certain contaminants, and exposure from dermal, diet, or inhalation are some examples.

The pie chart image on slide 10 of the PowerPoint presentation shows the total allowable dosage (RfD). Twenty percent is the minimum value that EPA has identified in 2000 methodology, and is considered the default value used to derive most human health criteria. Eighty percent is the cap or ceiling if you have data or if EPA has data. You can have some percentage between 20% & 80% for RSC.

- Q: Can you have 100%? EPA recommends 80% to allow for some uncertainty in exposure from other sources.
- Q: When you're talking about RSC, you are considering all other sources, right? Yes. RSC is your potential exposure to a chemical as well as an uncertainty factor.
- Q: If all other sources were known to total 20%, then the remaining source is attributed to fish? Yes-this is potentially correct provided you have an accurate accounting of sources other than fish and water AND you leave 20% available to address uncertainty. This is why RSC is capped at 80% rather than 1.
- C: I wanted to share a-ha moment I had while reading through the meeting materials. I'm concerned about marine mammal consumption. People who consume marine mammals, potentially receive their entire body burden plus some from consuming marine mammals. The notes for EPA's slide on p.6 discuss the 20% floor and 80% ceiling. When read the description, it says that at a certain point it is more important to reduce other exposure sources rather than developing criteria that will have a minimal impact on reducing total exposure of the population at large. The bottom line for me is that it may not be as complicated as I previously thought. If we don't have regional guidelines and want to be protective of coastal communities, we should stick with 20%.
- This assumes we wouldn't include marine mammals in RSC.
- The RSC for methylmercury is a bit different than the others in how it is calculated.
- The subtraction approach would allow you to include marine mammals. The rate would approach 1. Or you can use 80%.
- The ID paper pointed out that bioaccumulatives overtakes the other issues.
- Maybe marine mammals should be calculated differently?
- If you look at AK-specific data, there is higher concentration of methylated merc. in the tissue.
- Restating EPA: if the exposure source is marine mammals, then we should go to source to address.

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- If we do that, we would have to develop industry-specific guidelines. The problem in this case is that we can't control source since it's global. We can't always protect consumers because that is not always where they are getting their exposure.
- Q: In looking at methylmercury, the calculator was handy. For methylmercury the RSC is calculated at 2.7×10^{-5} . What does that mean? It's a very low number. Does that mean we're not going to get methylmercury from water? Yes, not from drinking water but from fish consumption because methylmercury doesn't manifest itself in water column but rather in tissue
- Q: This brings up the topic of population to consider? Should we consider populations that don't consumer marine mammals?
- The new recommendations are based on fish tissue samples. It should be based on where you source comes from. This could require changing sampling and lab protocols. AK will need to look at this at some point in the future.
- For some chemicals you can have bioaccumulation factors for chemicals that are present but can't easily be measured. (Brett). You can't see it unless you look at fish tissue or marine mammal tissue.
- To regulate discharge, you can't measure [methylmercury] using a bioaccumulation factor of 10^{-6} .
- EPA: This is the problem with mercury. You end up having to do modeling to see how different sources affect mercury in fish. You can look at things other than the water column.
- C: The last conversation about capturing marine mammals in the FCR lent a little more clarity to the issue of whether to include marine mammals in the consumption rate.
- EPA: Another constraint, raised in Idaho is that you shouldn't be adjusting your values so that they end up exceeding the RfD or CSF. Those values are set and if you try to adjust your BAF or other factors, you could exceed the maximum allowable dosage.
- We should look at fish consumption rates for PCBs. Those eating marine mammal fat are probably over the reference dose.
- This is the point. We need to develop criteria for the source of the contaminant. What part of the contaminant load is coming from the fish? We need to look at local fish.
- The rate should be regional. We can control the source for non-marine mammal consumers.
- (Kendra) We need to look at tropic levels and how they might differ by region. It should be split out by region. We will have to put all these things together.
- Q: What's the status of tropic level 5? A: EPA (Lon) will talk to HQ. It is possible to develop the values and is something they can take a look at.
- There is a difference if you consume the fat vs the meat of marine mammals. There are different tropic level within the animal. It is also important to understand exposure.
- The North Slope has done more studies. They're measuring actual food items like muktuk and seal meat in stew. The studies show there are differences.

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- I'm thinking about the potential uses of regionalization. There would be use differences in the RSC. The North Slope would have higher/different perspective than SE AK. Does this sound reasonable? Yes. It will affect the regional discussion. The ID paper increased RSC up in certain areas.
- At some point, bioaccumulation makes fish consumption the driving factor and not RSC or FCR
- EPA: EPA started out at 20%. Then we started looking at bioaccumulatives. There were other constraints to increasing the RSC from 20%, including exposure from other sources. Exposure can't exceed the reference dose. This is EPA's concern with ID's approach.
- I'm sympathetic with this; however, the issue, as the workgroup, is to focus on AK. EPA has to make one size to fit all. Our responsibility is to go with an AK approach that makes sense to AK.
- EPA doesn't want people exposed to sources that exceed reference dose.
- RSC only covers non-carcinogens. If marine mammals have carcinogens, we need to have a different way to deal with that.

Brock directed the group to a paper by Cal EPA. While it wasn't provided with the meeting packet, Brock will provide a copy of it to anyone who is interested. Cal EPA looked at EPA's 2000 methodology. Cal EPA concluded that there's room for improvement in EPA's methodology, but there are few values other than the defaults that are currently available.

There are some other issues to consider. In an ideal world, we would have better information. Increased fish consumption rate should lead to decreased exposure from other dietary sources since you are making a calorie choice and not consuming more food.

Bioaccumulation affects RSC. Bioaccumulation acts as a multiplier for the dose received by consuming fish.

- Q: Has EPA offered a clear response to ID or WA State? There is no formal documented response. There have been informal conversation with ID on their paper. The conversation in WA State is ongoing. WA State's criteria is still in development. FC & Relative source – no straight forward answer. You never want to exceed the recommended reference dose. If don't know the source in the rest of your diet, just changing fish consumption doesn't help.
- EPA: There is exposure from lots of other sources. RSC is problematic. You need to have good data, and the data is lacking.

EPA makes no distinction between use of RSC for fish consumption alone (marine) and fish and water (freshwater) consumption. You need to avoid double counting by either 1) include marine fish in FCR and adjust RSC accordingly or 2) separate the two issues per EPA methodology. This is important to keep in mind when we are considering marine mammal consumption.

- The conversation today is driving home the point that all the factors are inter-related.

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On PowerPoint slide 19, Brock gave the example of Hexachloropentadiene. It has a high bioaccumulation factor. The reference does could be consumed in the fish consumption rate. Does it all depend on the BAF? This is discussed in the ID paper.

Brock talked about how other states have thought about RSC. In 1992, the National Toxics Report used a RSC of 1. OR used EPA's values. ID use all of EPA's recommendations. WA is proposing a RSC of 1 from a policy view. TX justified a RSC of 1 by 1) using childhood exposure values and 2) considering the use of the RSC as an additional layer of conservatism. The Spokane Tribe used an RSC of 1 based on historical consumption value.

There are different thoughts on how to approach RSC. It is not a one-size-fits-all situation. The workgroup needs to think about all the facets, but ultimately, it's a risk management decision that needs to be grounded in science.

Brock presented several discussion questions:

1. Is Alaska in a position to consider anything but the default values?
 2. If Alaska was to include ALL sources of fish in the FCR, should it apply an RSC of .8 or 1?
 3. Is there a hybrid approach?
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- It is hard to consider these questions until we know the FCR. Where will marine mammals fall? Will DEC be taking a regional approach? Without a clear information, I can't really talk about these issues.
 - We understand, but DEC would like to hear which options maybe more interesting or less interesting to the group. Looking at BAF, is there any interest in going beyond .8? For marine mammals, we can't control all contamination because they are not affected by forces that we regulate.
 - We can't use the hybrid option and not consider marine mammals. We need to consider what makes sense for AK.
 - As long as we can control pollution.
 - Q: (for EPA) Have you gone through at looked at RSC for specific chemicals? A: EPA – all results-adjusted or otherwise, are the result of using the decision tree approach.
 - DEC: EPA has adjusted some RSC for some chemicals, but they are still using default values for most contaminants. It is not clear if the value is based on not enough information or if the value is the actual number.
 - EPA: It might be helpful to have a table to show how the RSC values were derived. EPA will bring it up to HC to create such a table.

We could do a chemical by chemical approach. Some states are looking at broad brush approach for groups of chemicals. There would need to be policies for bioaccumulation and whether to include

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marine animals vs. non-marine fish. Most states are using the broach brush approach and the not chemical by chemical approach.

In context of a previous comment and think about what we can really address now. Let's move towards end of presentation and talk about next steps. What is the best way to have discussions on tough questions?

Before talking about next steps, Brock tied up some loose ends on slides 22 and 23. With regard to Contaminate Source Tracking for persistent organic pollutants (POPs), there have been some studies, and they are not showing that POPs are present in AK. Some harbors have elevated PAH concentrations. There is ongoing work in Seldovia. They are looking at fish tissue from communities near them. For another project, they are getting baseline data for Seldovia Bay and streams around Seldovia.

- Q: In thinking about harbors and pH, are there any plans to systematically look at shellfish? They are the ones that bioaccumulate pHs. A: Seldovia – not sure how much there is for shellfish in Cook Inlet. NOAA has tested samples. There is some shellfish testing but not sure how much in AK.

Another loose end that Brock reported back on was the Asian Fish Consumption Survey in King County, WA. There were questions before the workgroup about other subpopulations. Brock found that the demographic information for King County may be similar to Anchorage. However, In King County, the majority of harvest is shellfish while in AK, the majority of the harvest could be vastly different. Therefore, we can't draw any conclusions from the King County survey.

- EPA: What the King County study does is to identify a group that has high seafood consumption. Also, there were lots of differences between Asian groups.
- EPA: We would like to see a presentation by Dr. Gerlach and Dr. Hamade on their contaminant work, particularly the contaminant distribution in fish and water. A: Dr. Hamade replied that he can map mercury values by region. The map won't tell what they're eating, but it will show how much mercury they are getting. A: Dr. Gerlach said that they can give this presentation. They can correlate fish consumption to the hair data. They can also bring in ADF&G information. A: Dr. Hamade said that women eating pike tend to have higher mercury levels in their hair.
- Q: Can the presentation also include women with high levels of mercury in their hair and are also mammal consumers?
- In the research, it was important to distinguish between pike and salmon. Pike is a better indicator of local environment.
- The next meeting will be on the issue of reginal factors and regional criteria. This might be good information to have for that discussion.
- ADF&G may be able to help with the consumption studies. It would be helpful to look at marine mammal vs non-marine mammals.

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- ADF&G: We have that information. We are working to put together that information for the group, especially information on marine mammals and marine mammals plus fish.
- (to ADF&G), what is the basis for your regional lines? A: We draw the regional lines in different ways. In the database, it is based on DEC's map of the different areas, such as SE, SC, Arctic, etc. For specific studies in certain areas, can look at upper river vs lower river. We also have community level data that we can group as needed.
- USGS hydrographic database is also available. This database is based on ecoregions.
- Michelle proposed a breakout group of Dr. Hamade, Dr. Gerlach, Dr. Fall, and Dr. Verbrugge to think about ways to present this information to the workgroup to help inform the regional discussion.
- The next meeting is scheduled for February 23rd. We could push back the regional conversation scheduled for that meeting so that we can have more information for the discussion.

Brock will talk to the subgroup and report back to everyone if we need to move or cancel the February meeting. He will try to report back to the workgroup within a week.

Nancy suggested that the workgroup keep the February meeting date even if the topic changes. DEC is preparing AFE slides to address bioaccumulation vs bioconcentration. The discussion on that topic could be moved up.

The next loose end was seafood imports. The numbers for seafood imports is on PowerPoint slide 23. The information on this PowerPoint slide is for imports only and not how much we consume based on what we catch. This is how much we consume based on what we buy in the store.

- EPA: This information shows that AK relies on subsistence foods. It would be nice to see urban data, but I understand that the data would be more complicated to get.
- Can DEC's economist help with collecting urban data?
- This data would be harder to collect. There are people buy seafood at Costco and ship home. What is purchased in ANC doesn't always get consumed in ANC.

Brock moved the conversation to next steps. The proposed topic for the next meeting is options for developing criteria on a statewide/regional/site-specific basis.

- C: It seems like we are taking different bites at different parts of the elephant. We can't look at everything all at once until we've had time to look at the different elements. We can't fit everything together until we understand all the different parts.
- There are different ways to approach relative source and other parts of the formula. You have to look at everything to see which way you want to do it.
- We need to look at all issues. We can keep implementation off the table for now. I would like to see a full day face-to-face meeting to see full picture.

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- We can add a discussion about a full day meeting to next meeting agenda. DEC does have some constraints relative to the budget. This might be an area where we can justify our travel. This is so important that we might be able to get a waiver for travel.
- If we keep revisiting issues, there is a danger of pounding them into the ground. We may not be able to look at one issue in depth. The discussion could drag on for a while.
- If we decide to have face-to-face meeting, we will send out doodle poll.
- When trying to determine a date to meet, you need to have more than a few days together as options.
- I agree with most of what the group said. Today's material was helpful. The issue of double counting was helpful.
- I feel like it's time to start going down rabbit hole on some of the topics. It seems like we are getting close (80%) on some of these topics.

When DEC sends out notes, let Brock know if you feel like we're close to getting to a recommendation on a topic. Then it can be raised to the group at large.

Nancy talked about sending out a more complete report to see if we are close on some of the earlier issues. It seems like the workgroup may be closer on some pieces.

- I don't feel close to recommendation on a topic. I would like to focus more on the issues before getting to a recommendation. I'm worried that will produce a report that doesn't have all of the information and options.

Michelle asked the group about timeline and if it is realistic. Do we need to take more time?

- Starting with the summer, some workgroup members won't be available again until the fall.
- DEC will send out the meeting notes for feedback.

Presentations at Alaska Forum on the Environment- Tues/Wed afternoon

Brock briefly mentioned that he will be presenting at AFE on some of these topics.

Public Comment

- At a previous meeting, Nancy did a good presentation on implementation. I encourage you to think about that. You need to think about implications of your recommendations. You may end up with water quality criteria that you may not know how to implement. HHC is important, and you need to think about effects on the regulated community.

Meeting Adjourned ~11:10